

CLAIMS

WHAT IS CLAIMED IS:

1. A method of manufacturing a substrate for an electro-optical device, having a base layer provided with concavo-convex portions on the surface thereof, and a reflecting layer disposed on the base layer and having a light reflecting property, the method comprising:

a coating step of coating the substrate with a photosensitive material;

an exposure step of exposing the photosensitive material on a surface of the photosensitive material so that a region outside of a plurality of isolated patterns disposed in a closed region and dispersed into the closed region so as not to intersect with an outline of the closed region is one of an exposed portion and an unexposed portion, and so that the other region is the other of the exposed portion and the unexposed portion;

a development step of forming the base layer by developing the photosensitive material exposed by the exposure step; and

a step of forming a reflecting layer having a light reflecting property on the base layer.

2. The method of manufacturing a substrate for an electro-optical device according to claim 1, wherein the

closed region is interposed between a first outline surrounding the closed region and a second outline inside the first outline.

3. The method of manufacturing a substrate for an electro-optical device according to claim 2, wherein in the exposure step, the photosensitive material is exposed so that a minimum value of a distance between each of the plurality of the isolated patterns and the second outline is 4 μm or more.

4. The method of manufacturing a substrate for an electro-optical device according to claim 3, wherein in the exposure step, the photosensitive material is exposed so that the minimum value of the distance between each of the plurality of the isolated patterns and the second outline is 12 μm or less.

5. The method of manufacturing a substrate for an electro-optical device according to claim 2, further comprising a concavo-convex-portion absorbing-layer forming step of forming, on the base layer, a concavo-convex-portion absorbing layer for absorbing some parts of the concavo-convex portions formed on a surface of the concavo-convex-portion absorbing layer,

wherein the reflecting layer is formed on the concavo-convex-portion absorbing layer which is formed in the concavo-convex-portion absorbing-layer forming step.

6. The method of manufacturing a substrate for an electro-optical device according to claim 3, further comprising a concavo-convex-portion absorbing-layer forming step of forming, on the base layer, a concavo-convex-portion absorbing layer for absorbing some parts of the concavo-convex portions formed on a surface of the concavo-convex-portion absorbing layer,

wherein the reflecting layer is formed on the concavo-convex-portion absorbing layer which is formed in the concavo-convex-portion absorbing-layer forming step.

7. The method of manufacturing a substrate for an electro-optical device according to claim 4, further comprising a concavo-convex-portion absorbing-layer forming step of forming, on the base layer, a concavo-convex-portion absorbing layer for absorbing some parts of the concavo-convex portions formed on a surface of the concavo-convex-portion absorbing layer,

wherein the reflecting layer is formed on the concavo-convex-portion absorbing layer which is formed in the concavo-convex-portion absorbing-layer forming step.

8. The method of manufacturing a substrate for an electro-optical device according to claim 1, wherein in the exposure step, a minimum value of a distance between each of the plurality of the isolated patterns and the outline surrounding the closed region is within a predetermined range.

9. The method of manufacturing a substrate for an electro-optical device according to claim 8, wherein the predetermined range further comprises 4 μm to 12 μm .

10. The method of manufacturing a substrate for an electro-optical device according to claim 8, wherein the predetermined range further comprises 4 μm to 7 μm .

11. The method of manufacturing a substrate for an electro-optical device according to claim 1, wherein a developer is sprayed on the base layer in the development step.

12. A method of manufacturing an electro-optical device comprising the method of manufacturing a substrate for an electro-optical device according to claim 1.

13. A substrate for an electro-optical device, comprising:

a substrate;

a base layer formed on the substrate and having a plurality of at least one of concave portions and convex portions on a surface thereof; and

a reflecting layer formed on the base layer and having a light reflecting property,

wherein the plurality of the at least one of concave portions and convex portions is formed so as not to extend to an edge of the base layer.

14. The substrate for an electro-optical device according to claim 13,

further comprising an aperture including a light transmitting portion for transmitting light in the base layer,

wherein the plurality of the at least one of the concave portions and convex portions is formed so as not to extend to an edge of the aperture, and

wherein the reflecting layer is disposed in a portion excluding the aperture on the surface of the base layer.

15. The substrate for an electro-optical device according to claim 13, wherein a distance between the edge

of the base layer and an envelope encircling all of the plurality of the at least one of the concave portions and convex portions is in a predetermined range.

16. The substrate for an electro-optical device according to claim 15, wherein the predetermined range further comprises 4 μm to 12 μm .

17. An electro-optical device, comprising:
the substrate for an electro-optical device according to claim 13;

a counter substrate that faces the substrate for the electro-optical device; and

an electro-optical material disposed between the substrate for the electro-optical device and the counter substrate.

18. The electro-optical device according to claim 17, comprising:

a first electrode disposed on the substrate for the electro-optical device; and

a second electrode disposed on the counter substrate,

wherein the electro-optical material is a liquid crystal and the liquid crystal is disposed between the first electrode and the second electrode.

19. An electronic apparatus comprising the electro-optical device according to claim 17 as a display unit.

20. A mask for forming a base layer on a substrate, the base layer having a concave portion and a convex portion on a surface thereof, the mask comprising:

a convex-portion pattern corresponding to the convex portion; and

a concave-portion pattern corresponding to the concave portion,

wherein an edge of the base layer corresponds to an edge of the convex-portion pattern, and

wherein the concave-portion pattern does not extend to the edge of the base layer.

21. A mask for forming a base layer on a substrate, the base layer having a concave portion and a convex portion on a surface thereof, the mask comprising:

a convex-portion pattern corresponding to the convex portion; and

a concave-portion pattern corresponding to the concave portion,

wherein an edge of the convex-portion pattern is positioned outside of the concave-portion pattern.

22. A mask for forming a base layer on a substrate, the base layer having a concave portion and a convex portion on a surface thereof, the mask comprising:

a convex-portion pattern corresponding to the convex portion; and

a concave-portion pattern corresponding to the concave portion,

wherein the convex-portion pattern has a frame region surrounding the concave-portion pattern.

23. The mask according to claim 20, wherein the edge of the convex-portion pattern is positioned at the outermost part of the concave-portion pattern, but is positioned 4 μm to 7 μm away from a periphery of the base layer.

24. The mask according to claim 21, wherein the edge of the convex-portion pattern is positioned at the outermost part of the concave-portion pattern, but is positioned 4 μm to 7 μm away from the periphery of the base layer.

25. The mask according to claim 22, wherein the edge of the convex-portion pattern is positioned at the outermost part of the concave-portion pattern, but is positioned 4 μm to 7 μm away from the periphery of the base layer.

26. A substrate for an electro-optical device, comprising:

a base layer formed on the substrate;

a plurality of concave portions and a plurality of convex portions on a surface of the base layer; and

a light reflecting layer on the base layer;

wherein all of at least one of the plurality of the concave portions and convex portions are spaced apart from an edge of the base layer.